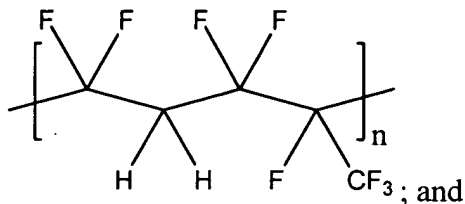


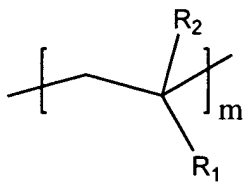
CLAIMS

What is claimed is:

1. A block copolymer comprising a fluorinated block and at least one non-fluorinated block, wherein the fluorinated block has the following structure:



wherein the non-fluorinated block has the following structure:

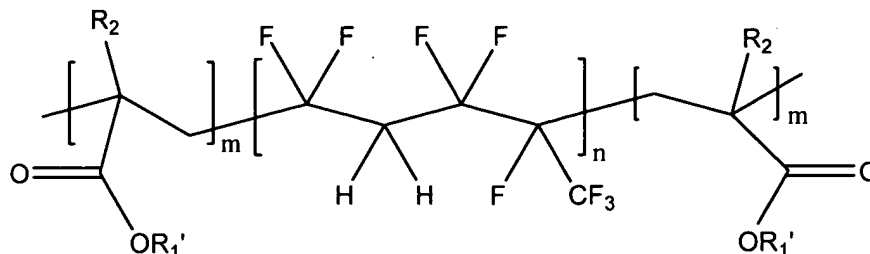


wherein R₁ is selected from the group consisting of -CH₃, -CF₃, -CH₂CH₃, -CH₂CH₂CH₃, -CH₂CH₂CH₂CH₃, -phenyl, naphthyl, -COOR₃, and -CONR₃R₄;

- 10 wherein R₂ is selected from the group consisting of -H, -CH₃, -CF₃, -CH₂CH₃, -CH₂CH₂CH₃, -CH₂CH₂CH₂CH₃, -phenyl, and naphthalenyl; and

wherein R₃ and R₄ are selected from the group consisting of -CH₃, -CH₂CH₃, -CH₂CH₂CH₃, -CH₂CH₂CH₂CH₃, -CH₂CH₂OH, and -PEG.

- 15 2. The block copolymer of claim 1 having a formula of the following structure:



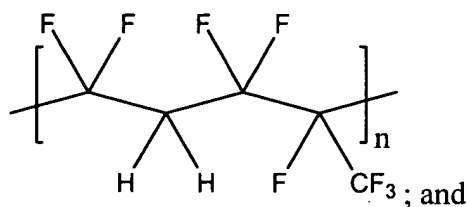
wherein R_1 is selected from the group consisting of $-\text{CH}_3$, $-\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{OH}$, and $-\text{PEG}$, and

wherein R_2 is selected from the group consisting of $-\text{H}$ or $-\text{CH}_3$, $-\text{CF}_3$, $-\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{phenyl}$ and $-\text{naphthyl}$.

3. The block copolymer of claim 2 wherein R_1 is $-\text{CH}_3$, $-\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{OH}$, or $-\text{PEG}$, and

wherein R_2 is $-\text{H}$ or $-\text{CH}_3$.

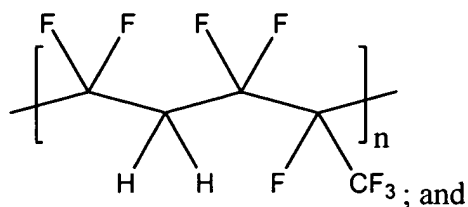
4. A block copolymer comprising a fluorinated block and at least one non-fluorinated block, wherein the fluorinated block has the following structure:



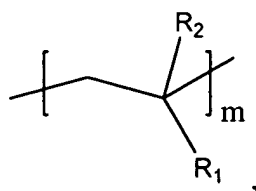
wherein the non-fluorinated block is a polymer selected from the group consisting of polyesters, polyethers, polyanhydrides, polyglycols, poly(alkylene oxides), polyhydroxyalkanoates, polyphosphazenes, polyurethanes, and a combination thereof.

5. A polymeric coating composition comprising a block copolymer which comprises a fluorinated block and at least one non-fluorinated block, wherein the

fluorinated block has the following structure:



wherein the non-fluorinated block has the following structure:

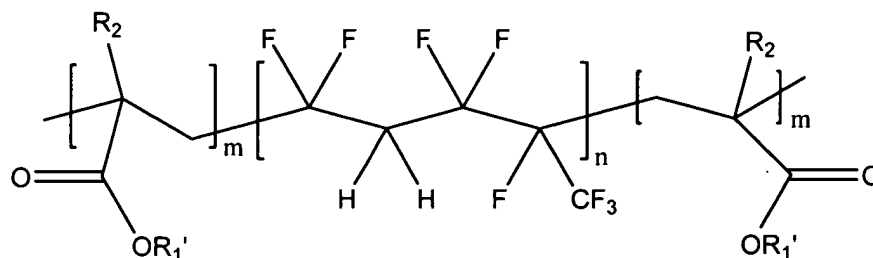


5 wherein R_1 is selected from the group consisting of $-\text{CH}_3$, $-\text{CF}_3$, $-\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, -phenyl, naphthyl, $-\text{COOR}_3$, and $-\text{CONR}_3\text{R}_4$;

wherein R_2 is selected from the group consisting of $-\text{H}$, $-\text{CH}_3$, $-\text{CF}_3$, $-\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, -phenyl, and naphthalenyl; and

wherein R_3 and R_4 are selected from the group consisting of $-\text{CH}_3$, $-\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{OH}$, and -PEG.

6. The coating composition of claim 5 wherein the block copolymer has a formula of the following structure:



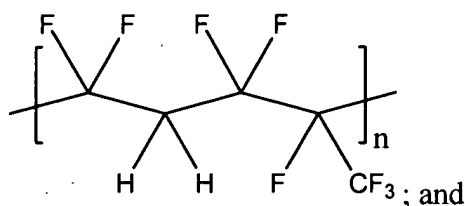
wherein R_1' is selected from the group consisting of $-\text{CH}_3$, $-\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{OH}$, and -PEG, and

wherein R_2 is selected from the group consisting of $-H$ or $-CH_3$, $-CF_3$, $-CH_2CH_3$, $-CH_2CH_2CH_3$, $-CH_2CH_2CH_2CH_3$, $-phenyl$ and $naphthyl$.

7. The coating composition of claim 6 wherein R_1 is selected from the group consisting of $-CH_3$, $-CH_2CH_3$, $-CH_2CH_2CH_3$, $-CH_2CH_2CH_2CH_3$, $-CH_2CH_2OH$,
5 or $-PEG$, and

wherein R_2 is $-H$ or $-CH_3$.

8. A polymeric coating composition comprising a block copolymer which comprises a fluorinated block and at least one non-fluorinated block, wherein the fluorinated block has the following structure:



wherein the non-fluorinated block is a polymer selected from the group consisting of polyesters, polyethers, polyanhydrides, polyglycols, poly(alkylene oxides), polyhydroxyalkanoates, polyphosphazenes, polyurethanes, and a combination thereof.

- 15 9. The coating composition of claim 5 further comprising a bioactive agent.
10. The coating composition of claim 6 further comprising a bioactive agent.
11. The coating composition of claim 7 further comprising a bioactive
20 agent.

12. The coating composition of claim 8 further comprising a bioactive agent.

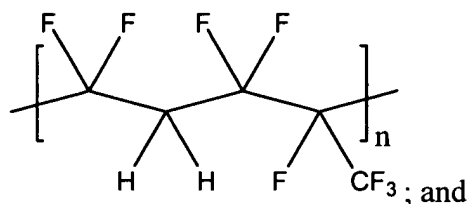
13. The coating composition of claim 9 wherein the bioactive agent is selected from the group consisting of tacrolimus, dexamethasone, rapamycin, Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-rapamycin, and 40-O-tetrazole-rapamycin.

14. The coating composition of claim 10 wherein the bioactive agent is selected from the group consisting of tacrolimus, dexamethasone, rapamycin, Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-rapamycin, and 40-O-tetrazole-rapamycin.

15. The coating composition of claim 11 wherein the bioactive agent is selected from the group consisting of tacrolimus, dexamethasone, rapamycin, Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-rapamycin, and 40-O-tetrazole-rapamycin.

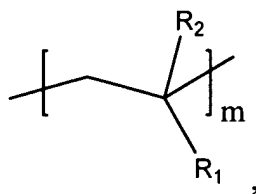
16. An implantable device comprising a coating which comprises a block copolymer, the block copolymer comprising a fluorinated block and at least one non-fluorinated block.

17. The implantable device of claim 16, wherein the fluorinated block has the following structure:



20

wherein the non-fluorinated block has the following structure:

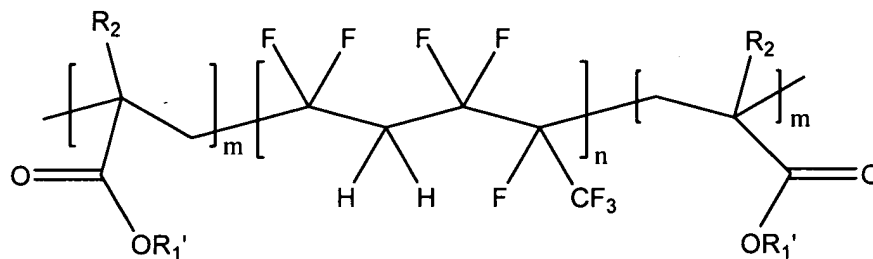


wherein R_1 is selected from the group consisting of $-\text{CH}_3$, $-\text{CF}_3$, $-\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, -phenyl, naphthyl, $-\text{COOR}_3$, and $-\text{CONR}_3\text{R}_4$;

5 wherein R_2 is selected from the group consisting of $-\text{H}$, $-\text{CH}_3$, $-\text{CF}_3$, $-\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, -phenyl, and naphthalenyl; and

wherein R_3 and R_4 are selected from the group consisting of $-\text{CH}_3$, $-\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{OH}$, and -PEG.

18. The implantable device of claim 17, wherein the block copolymer has a
10 formula of the following structure:



wherein R_1' is selected from the group consisting of $-\text{CH}_3$, $-\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{OH}$, and -PEG, and

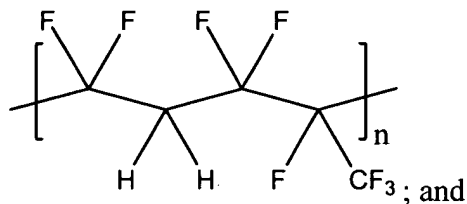
15 wherein R_2 is selected from the group consisting of $-\text{H}$ or $-\text{CH}_3$, $-\text{CF}_3$, $-\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, -phenyl and naphthyl.

19. The implantable device of claim 18 wherein R_1' is selected from the group consisting of $-\text{CH}_3$, $-\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{CH}_2\text{CH}_2\text{OH}$,

or -PEG, and

wherein R_2 is -H or -CH₃.

20. The implantable device of claim 16, wherein the fluorinated block has the following structure:



wherein the non-fluorinated block is a polymer selected from the group consisting of polyesters, polyethers, polyanhydrides, polyglycols, poly(alkylene oxides), polyhydroxyalkanoates, polyphosphazenes, polyurethanes, and a combination thereof.

10 21. The implantable device of claim 16, which is a drug-eluting stent, wherein the coating further comprises a bioactive agent.

22. The implantable device of claim 17, which is a drug-eluting stent, wherein the coating further comprises a bioactive agent.

15 23. The implantable device of claim 18, which is a drug-eluting stent, wherein the coating further comprises a bioactive agent.

24. The implantable device of claim 19, which is a drug-eluting stent, wherein the coating further comprises a bioactive agent.

25. The implantable device of claim 20, which is a drug-eluting stent, wherein the coating further comprises a bioactive agent.

20 26. The implantable device of claim 21, wherein the bioactive agent is

selected from the group consisting of tacrolimus, dexamethasone, rapamycin, Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-rapamycin, and 40-O-tetrazole-rapamycin.

27. The implantable device of claim 22, wherein the bioactive agent is
5 selected from the group consisting of tacrolimus, dexamethasone, rapamycin, Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-rapamycin, and 40-O-tetrazole-rapamycin.

28. The implantable device of claim 23, wherein the bioactive agent is
selected from the group consisting of tacrolimus, dexamethasone, rapamycin,
10 Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-rapamycin, and 40-O-tetrazole-rapamycin.

29. The implantable device of claim 24, wherein the bioactive agent is
selected from the group consisting of tacrolimus, dexamethasone, rapamycin,
Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-
15 rapamycin, and 40-O-tetrazole-rapamycin.

30. The implantable device of claim 25, wherein the bioactive agent is
selected from the group consisting of tacrolimus, dexamethasone, rapamycin,
Everolimus, 40-O-(3-hydroxy)propyl-rapamycin, 40-O-[2-(2-hydroxy)ethoxy]ethyl-
rapamycin, and 40-O-tetrazole-rapamycin.

20 31. A method of treating restenosis or vulnerable plaque, comprising
implanting in a human being in need thereof the implantable device of claim 16.

32. A method of treating restenosis or vulnerable plaque, comprising

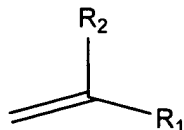
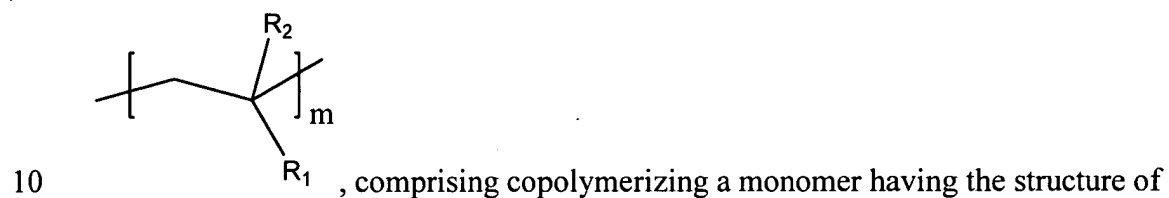
implanting in a human being in need thereof the implantable device of claim 17.

33. A method of treating restenosis or vulnerable plaque, comprising implanting in a human being in need thereof the implantable device of claim 26.

34. A method of treating restenosis or vulnerable plaque, comprising
5 implanting in a human being in need thereof the implantable device of claim 27.

35. A method of treating restenosis or vulnerable plaque, comprising implanting in a human being in need thereof the implantable device of claim 28.

36. A method of synthesizing a block copolymer comprising a fluorinated block and at least a block of the following structure:



in the presence of a di-halo macromer,

wherein R₁ is selected from the group consisting of -CH₃, -CF₃, -CH₂CH₃, -CH₂CH₂CH₃, -CH₂CH₂CH₂CH₃, -phenyl, naphthyl, -COOR₃, and -CONR₃R₄;

15 wherein R₂ is selected from the group consisting of -H, -CH₃, -CF₃, -CH₂CH₃, -CH₂CH₂CH₃, -CH₂CH₂CH₂CH₃, -phenyl, and naphthalenyl; and

wherein R₃ and R₄ are selected from the group consisting of -CH₃, -CH₂CH₃, -CH₂CH₂CH₃, -CH₂CH₂CH₂CH₃, -CH₂CH₂OH, and -PEG, and

wherein the di-halo macromer is selected from the group consisting of di-chloro macromer, di-bromo macromer, di-iodo macromer and a combination thereof.

37. The method of claim 36 wherein the di-halo macromer is formed by polymerizing a fluorinated olefin in the presence of a dihalide.

5 38. The method of claim 37 wherein the fluorinated olefin is selected from the group consisting of vinylidene fluoride, hexafluoropropylene, tetrafluoroethylene, and a combination thereof.

39. The method of claim 38 wherein the di-halo macromer is prepared by polymerizing a mixture of vinylidene fluoride and 1,1,2,3,3,3-hexafluoropropylene in
10 the presence of 1,2-diiodo-1,1,2,2-difluoroethylene.

40. The method of claim 39 the di-halo macromer has a structure of

